Figure 1:

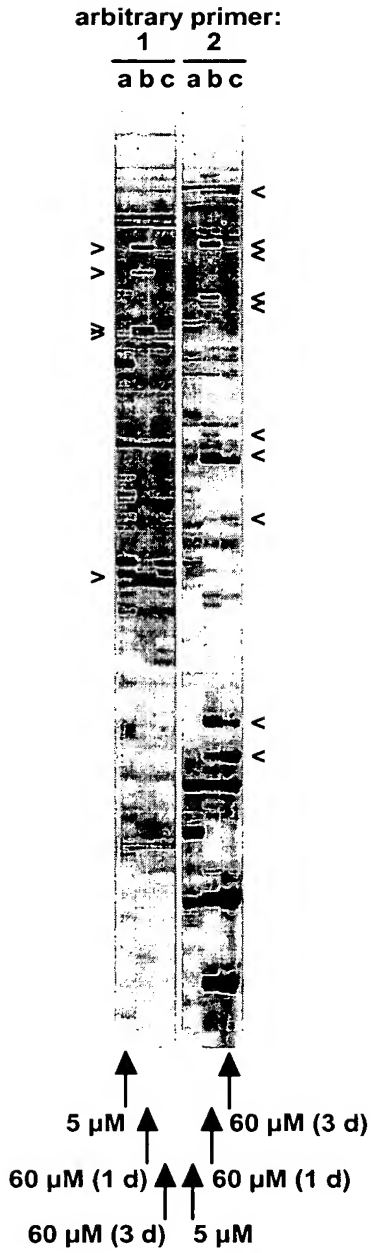

Figure 2:

```
>carbo#SD long
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SKSWDKPVIGTVKDTGYYLKFAPESAAEKCTLHTYNGEYILDHFHYHWGKKDGEGAEHFIDGKQYDIE
FHFVHKKVGLTDPDARDAFAVLGVFGKADPRLKINGIWELLSPSTVLTVDSTRNVADVVPSKLLPSAR
DYFHYEGSLTTPTYGEVVHWFVLNEPIAVPSEYLSALRQMQADKEGTVIDSNYRELQEVHNRPVQRFK
SDEQGRGEFDDISKNEDIVEDLSKLSGNFIRELVRKIYW
```

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GAATTCGGCACGAGGGACAACTTTGCATAACTTTTACTGTCCATGTTTAACGTTTAGATCTAG    63
TACTAGTAGTCTACAAGAACAACTGTCAACAACTGTCAGATTATGTGTATAAACCAAGATGTC   126
                                                          M  S      2
TGCAATTCTTAAGAGAAACGTACCTATCCAAAGAGTCGGTCTCCCACTGACCTCCTATGTCAG   189
  A  I  L  K  R  N  V  P  I  Q  R  V  G  L  P  L  T  S  Y  V  S     23
TAGATGGGCTTCTGCTCTGCCCACCAGGACCCATCCTTTTTACAAGTTGGTTGATGACAGTAC   252
  R  W  A  S  A  L  P  T  R  T  H  P  F  Y  K  L  V  D  D  S  T     44
CACCCCAGTGACAAGGTCTACTCTTCTCAGTGCTCATATGGTTGACACCTTGCTAGATGAGAA   315
  T  P  V  T  R  S  T  L  L  S  A  H  M  V  D  T  L  L  D  E  N     65
CCAGCAGAGCAGACATGAAAACCAACACACAGACACGTCTTACAAAATGTACCAGGGATTAAA   378
  Q  Q  S  R  H  E  N  Q  H  T  D  T  S  Y  K  M  Y  Q  G  L  K     86
ATTTGTTGTAAAGACGCTGTTTACTCCATCGAAATGCCACCGTCACTTCTCCACATCAGCTCA   441
  F  V  V  K  T  L  F  T  P  S  K  C  H  R  H  F  S  T  S  A  H    107
TTTGTCTGCCATGGGTCGACATCAATCCCCCATCAATATAATCACCTCCAGTACGACCAAAGG   504
  L  S  A  M  G  R  H  Q  S  P  I  N  I  I  T  S  S  T  T  K  G    128
ACCGTCATTGAAACCGTTAAAATTTAGCAAGAGTTGGGACAAGCCAGTAATCGGCACCGTCAA   567
  P  S  L  K  P  L  K  F  S  K  S  W  D  K  P  V  I  G  T  V  K    149
AGATACTGGCTATTATCTTAAATTTGCACCAGAATCTGCAGCAGAGAAGTGCACATTGCATAC   630
  D  T  G  Y  Y  L  K  F  A  P  E  S  A  A  E  K  C  T  L  H  T    170
GTACAATGGTGAATATATCCTAGATCATTTCCATTATCACTGGGGGAAGAAGGATGGGGAAGG   693
  Y  N  G  E  Y  I  L  D  H  F  H  Y  H  W  G  K  K  D  G  E  G    191
AGCAGAGCATTTCATCGATGGAAAACAATACGACATCGAGTTCCACTTTGTACATAAAAAGGT   756
  A  E  H  F  I  D  G  K  Q  Y  D  I  E  F  H  F  V  H  K  K  V    212
TGGGTTGACTGATCCAGATGCTAGAGACGCTTTTGCTGTTTTGGGCGTTTTTGGAAAGGCCGA   819
  G  L  T  D  P  D  A  R  D  A  F  A  V  L  G  V  F  G  K  A  D    233
CCCTCGTTTGAAGATCAATGGAATCTGGGAGCTACTCTCACCGTCAACTGTCCTGACTGTCGA   882
  P  R  L  K  I  N  G  I  W  E  L  L  S  P  S  T  V  L  T  V  D    254
CTCAACACGAAACGTCGCTGATGTTGTTCCCTCTAAGCTTCTCCCAAGTGCCAGAGACTATTT   945
  S  T  R  N  V  A  D  V  V  P  S  K  L  L  P  S  A  R  D  Y  F    275
TCACTATGAAGGTTCTTTGACCACACCTACGTATGGTGAGGTTGTGCACTGGTTTGTTCTCAA  1008
  H  Y  E  G  S  L  T  T  P  T  Y  G  E  V  V  H  W  F  V  L  N    296
TGAACCCATAGCTGTCCCTAGTGAGTATCTGTCAGCTCTGAGACAGATGCAAGCTGACAAAGA  1071
  E  P  I  A  V  P  S  E  Y  L  S  A  L  R  Q  M  Q  A  D  K  E    317
AGGTACTGTGATTGACTCAAACTATCGAGAGCTTCAAGAAGTCCACAATCGACCTGTGCAACG  1134
  G  T  V  I  D  S  N  Y  R  E  L  Q  E  V  H  N  R  P  V  Q  R    338
ATTTAAGAGTGATGAGCAAGGGAGAGGAGAATTTGACGATATTTCTAAGAATGAGGACATTGT  1197
  F  K  S  D  E  Q  G  R  G  E  F  D  D  I  S  K  N  E  D  I  V    359
GGAGGACTTGTCTAAATTGTCTGGTAACTTTATTAGAGAGCTGGTCAGGAAGATATATTGGTG  1260
  E  D  L  S  K  L  S  G  N  F  I  R  E  L  V  R  K  I  Y  W      379
ACCTTTTTCTACACTTGTTAGAGTTTTAGGCCAGAATACATTTCATCATTTGGACTGTTATTT  1323
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TGTGATTTGA                                                        1396
```

Figure 3:

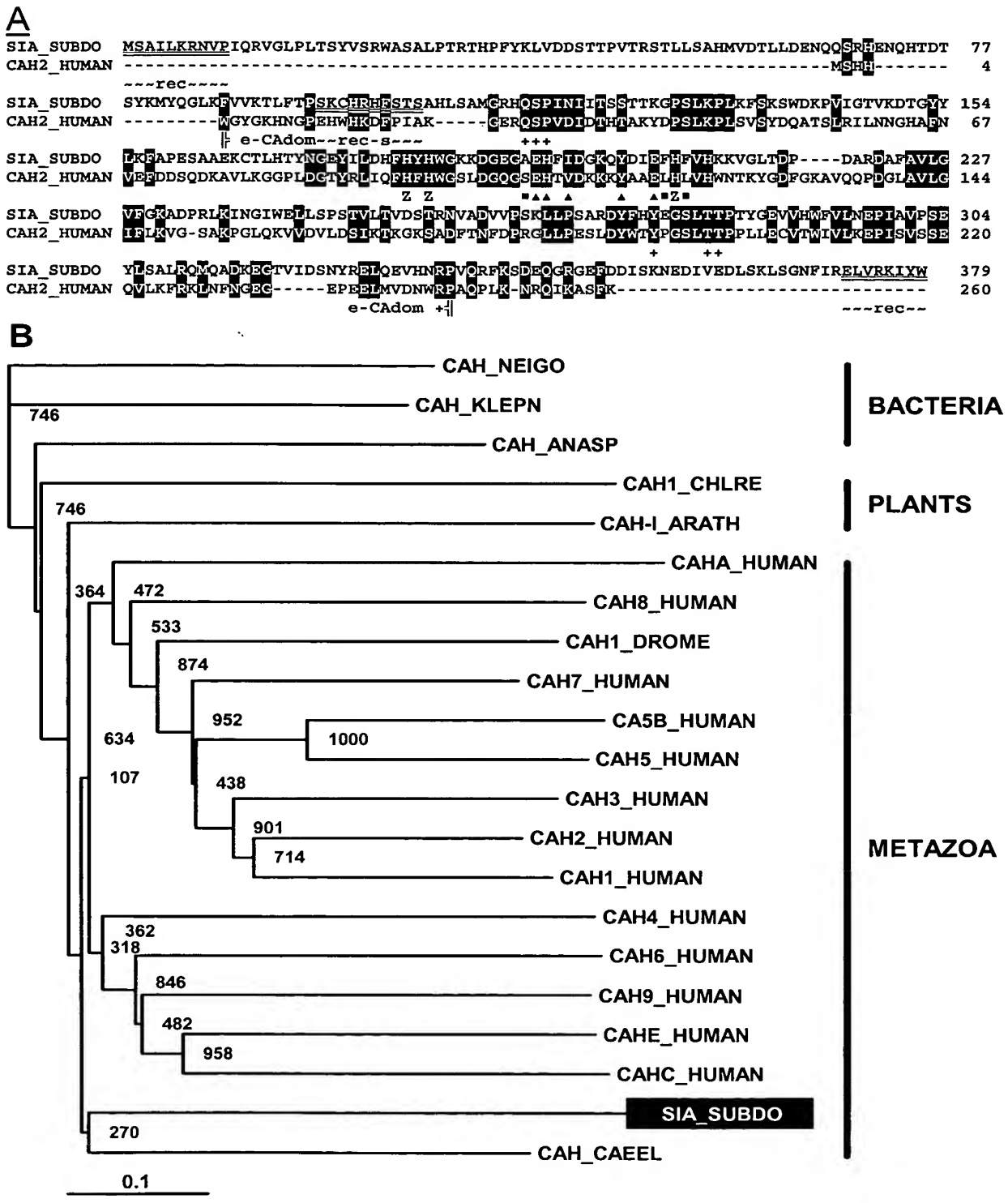


Figure 4:

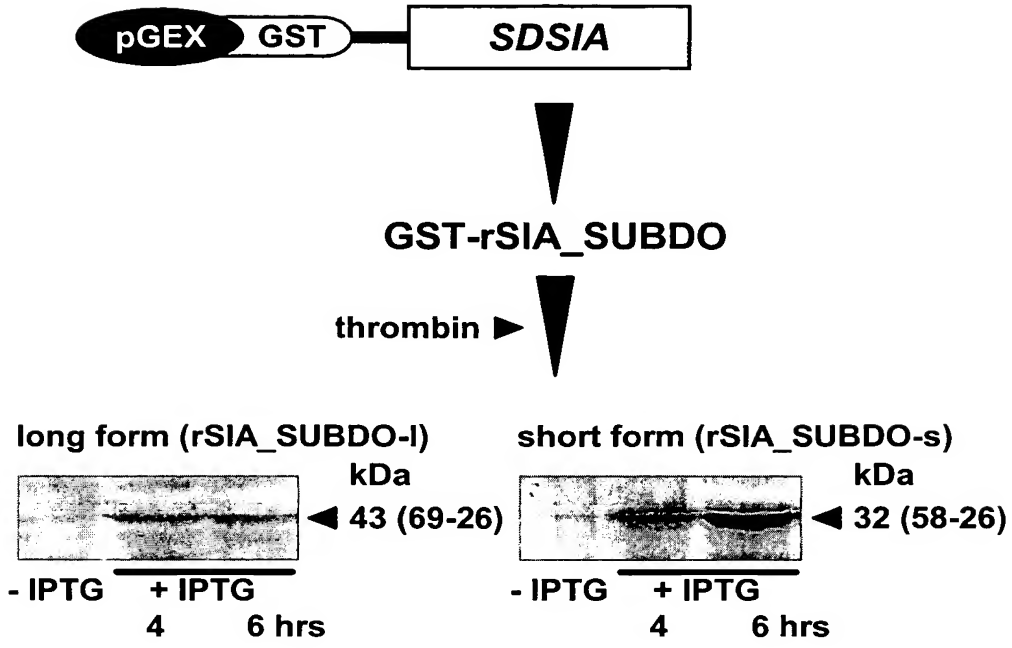


Figure 5:

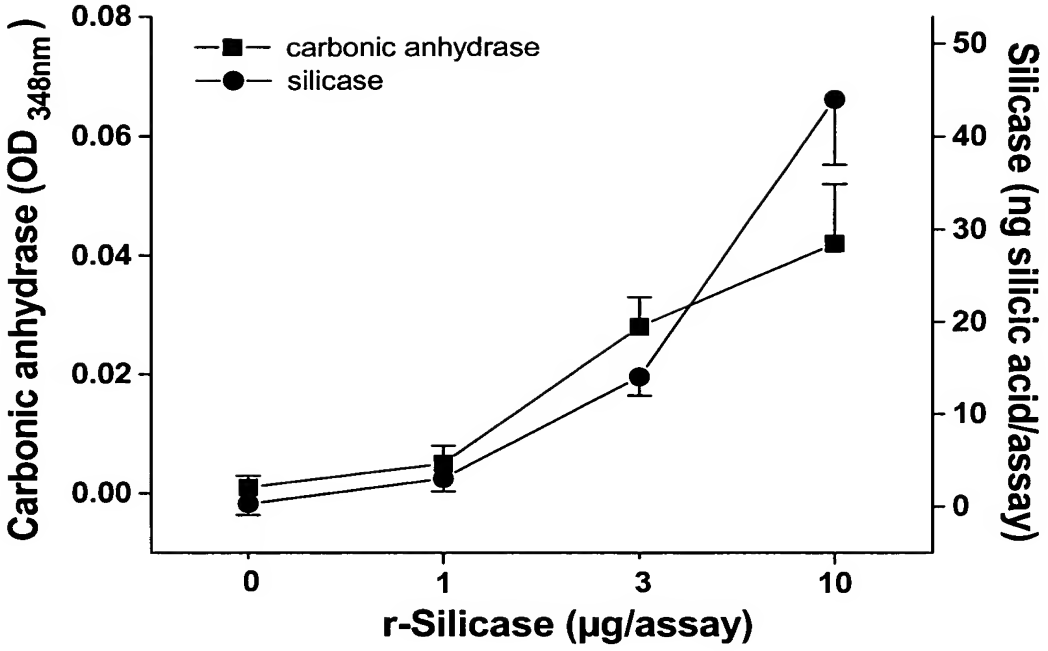

carbonic anhydrase
silicase
Carbonic anhydrase (OD 348nm)
Silicase (ng silicic acid/assay)
0.08
0.06
0.04
0.02
0.00
50
40
30
20
10
0
0
1
3
10
r-Silicase (µg/assay)

Figure 6:

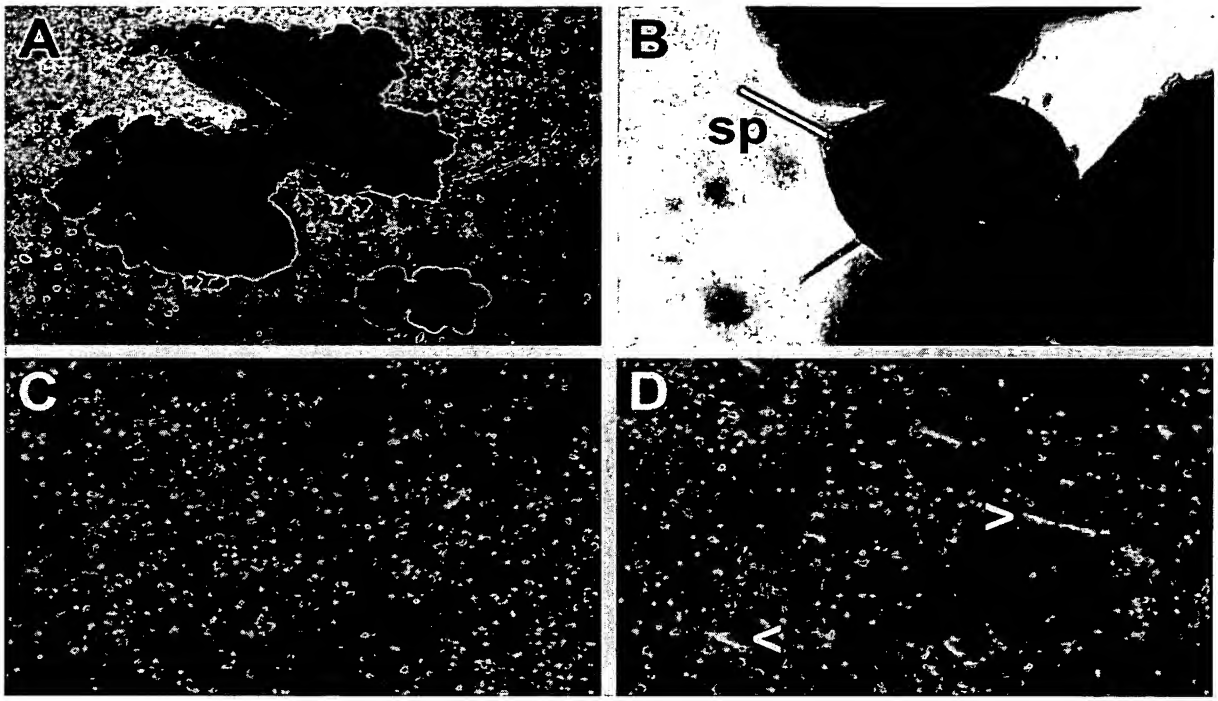


Figure 7:

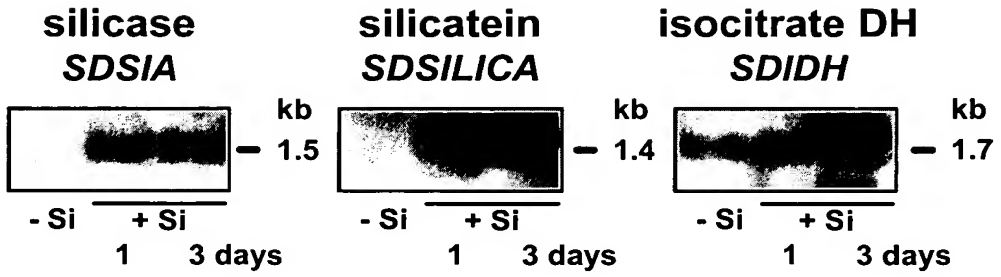
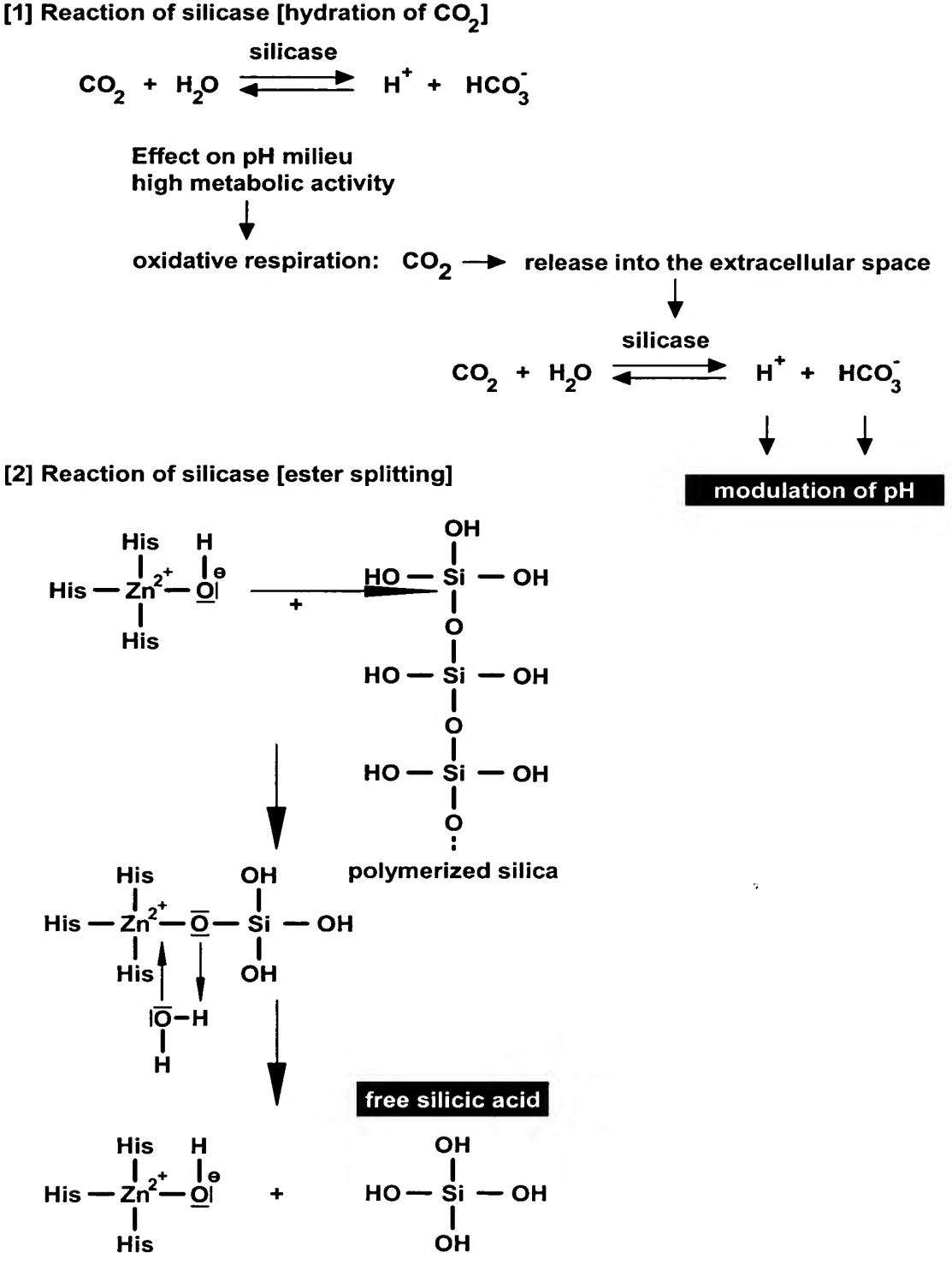


Figure 8:


[1] Reaction of silicase [hydration of CO_2]
silicase
$CO_2 + H_2O \rightleftharpoons H^+ + HCO_3^-$
Effect on pH milieu
high metabolic activity
oxidative respiration: CO_2 → release into the extracellular space
silicase
$CO_2 + H_2O \rightleftharpoons H^+ + HCO_3^-$
modulation of pH
[2] Reaction of silicase [ester splitting]
polymerized silica
free silicic acid

5

Figure 9: